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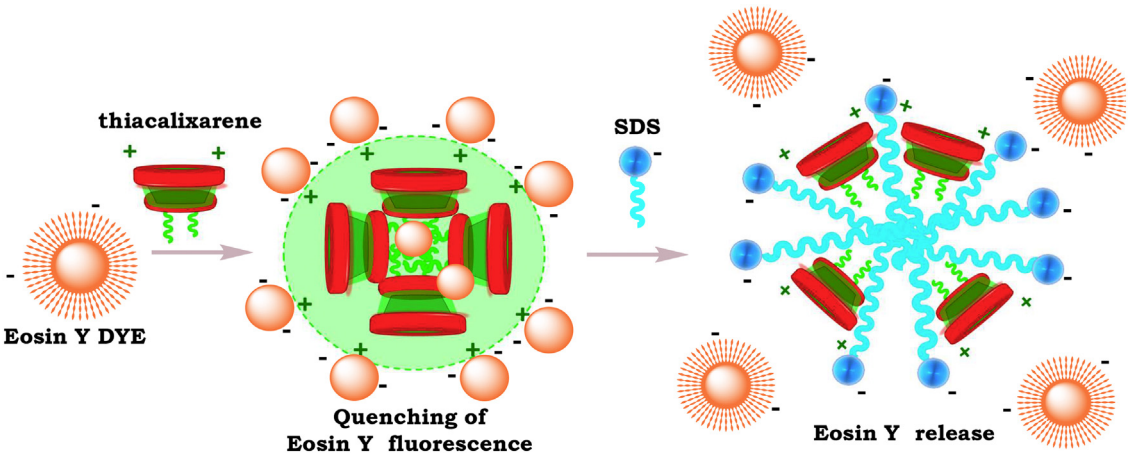
Detection of sulfate surface-active substances *via* fluorescent response using new amphiphilic thiacalix[4]arenes bearing cationic headgroups with Eosin Y dye

V.A. Burilov[a,*], D.A. Mironova[a], R.R. Ibragimova[a], R.I. Nugmanov[a], S.E. Solovieva[a,b], I.S. Antipin[a,b]

[a] *Kazan Federal University, 18 Kremlevskaya st. Kazan, 420008, Russian Federation*
[b] *A.E. Arbuzov Institute of Organic & Physical Chemistry, 8 Arbuzov str., Kazan, 420088, Russian Federation*

GRAPHICAL ABSTRACT



HIGHLIGHTS

- Synthesis of new *p-tert*-butylthiacalix[4]arene ammonium amphiphiles in *1,3-alternate* stereoisomeric form.
- Supramolecular associates of new *p-tert*-butylthiacalix[4]arene ammonium amphiphiles with Eosin Y dye.
- New fluorescent probe for sodium lauryl and laureth sulfates with response from 3.5 μM of SAS.

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* Corresponding author.
E-mail address: ultrav@bk.ru (V.A. Burilov).

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ABSTRACT

New ammonium-containing derivatives of *p-tert*-butylthiacalix[4]arene in *1,3-alternate* stereoisomeric form were synthesized *via* copper-catalyzed azide-alkyne cycloaddition (CuAAC) reaction of corresponding azides with N-propargyl-N,N,N-triethylammonium bromide. Critical aggregation concentration (CAC) of new amphiphilic thiacalixarenes **1-3** (with butyl, octyl and tetradecyl substituents) determined by pyrene micellization method are 91, 59 and 33 μM, respectively. According to DLS data the diameter of these aggregates is around 130 nm. Anionic dye Eosin Y (EY) forms the associates with positive charged thiacalixarenes **1-3**, shifts CAC to the low concentration region (2 μM) and decreases nanoaggregates size up to 90 nm. Thiacalixarene/EY associates were investigated as fluorescent probe for the determination